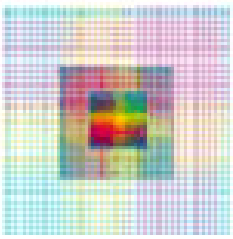


AUDIT II

Topic report
auditors' tools

Summary

This report is an integral part of the *AUDIT II project* which is co-financed within the framework of the EU SAVE II Program . The ultimate aim of the AUDIT II project is to establish a long-term cooperation of States, within the enlarged European area (including EU, Norway and CEECs), in the field of rational programming of *Energy Auditing* activities.

This objective is looked after to be achieved through a number of activities including:

- Editing of national monographs stating the situation and current programmes in the fields of energy auditing (Country reports)
- study of different topics related to energy audits (topic reports) from a more analytical point of view
- and to establish a network between people working with energy audit programs in each country

The horizontal analysis on the topic “Tools for energy auditors”, covered by this report, meets the project aim by indicating the most replicable elements and interfaces of energy audit support tools applied in the existing on going Energy Audit Programs (EAP). These elements are pointed out through the evaluation of practical national interpretations of the relevant, hereby defined, theoretical options. Characteristic practices are presented and the respective elements are recommended on the basis of collected information, as detailed in the upgraded Country Reports of the EU Member States and Norway.

The main objectives of this report are:

- Identify whether the EAP administrator or Operating Agent has developed or used or recommended, or even imposed, specific tools for subsequent Energy Auditing models considering there can be the following "basic" options:
    - no particular tool
    - list of "recommended" tools
    - compulsory tools

- When there are recommended or compulsory tools
    - how they have been selected or developed (and by whom: EAP administrator, other player like professional organisations,…)
    - give a "map" of tools versus energy auditing models (or specifications)
    - get to know how the information on their use is disseminated (links with training with marketing and other implementing instruments ? …)

- give information on some existing tools themselves

In that case the minimum information collected is :

- "Commercial" name
- contact person or organisation in charge of development or issuing
- Type of audit concerned
- Target sector
- Language and weather data available (or country(ies) were applicable)
- Cost and way of distribution (commercial, for free through training, shareware, freeware,…)

Introduction and Tools typology

The wording "tools for audits" or "auditors' tools" describes a large family of support documents and applications which are intended to facilitate the work of auditors in the view both of minimising audit costs AND maximising audit quality.

They are generally dependant from the Energy Audit Models but may address different stages in the study service and provide help either on technical matters or on marketing aspects.

When developed and/or recommended by an energy audit programme Operating Agent, they aim at solving particular difficulties met on a local (National) context. Still, the similarities between solutions experienced throughout diverse national programmes suggest that same problems have been encountered, leading to identical tools.

This makes "auditor's tools" one generic component of the "tool box" of an energy audit programme which justifies to consider a specific Topic Report on the matter. There is no extensive list of possible tools and each EAP operating Agent is able to invent new ones. Yet more frequently used items are listed and defined hereafter

Definitions - for the purpose of this report and study - of the various possible tools which are being (or can be) used in the audit realisation phase by the auditor

Tools may take different forms or media: flyers, guides or booklets, films, Web sites or CD-ROMs and the choice of the media, although important is often a compromise taking into account: cost of production, cost and easiness of dissemination, nature of the content. The definitions that follow are based on the contents and aim but make no distinction according to the dissemination or distribution medium.

Information/documentation on technical topics (ECOs[1], Branch specific,…)

Information support document, it is often based on case studies and intended to help marketing the audits in view of successful examples. Main target is the benefactor of the audit . The document focuses on one particular technique (and) or a specific sub sector (in the industry) and the information given is summarised mainly on results and interviews.
Depending on the accuracy of the information these tools can also be considered and/or used as promotion support elements.
These tools give clear message from the Administrator or the OA to the public: the audit programme has been a success and good results can be obtained.

Audit guide or audit handbook, energy management handbook

Core component of an energy audit scheme, the document is the basis of training sessions and is targeted essentially to auditors. It explains and describes how an audit is to be made, how the calculations are to be conducted, the types and contents of the most frequently proposed energy conservation options (ECOs). Although auditors are supposed to have a fair background in thermodynamics (and also electricity), these handbooks frequently entails a section of reminders of these energy related topics.
A handbook published / co-ordinated by the OA to the auditors shows that the auditors are considered to be a group of specialists who are “worth” of a special manual of their own. It also shows that energy auditing will be going on for some time, it is not a temporary activity for an year or two.

[1] Energy Conservation Options

Energy checks, Check-lists or walk through guides

Associated to energy audit models of the scanning type, these supports are developed in order to facilitate the work of the auditor, assuring in the same time both quality and rapidity of the survey. They are primarily intended for energy auditors but can be used also as self auditing tools for those energy managers in buildings or industrial premises than intend to start an energy management process by themselves before requiring external assistance.

Calculation methods and software

Other core component of energy audit schemes, calculation methods and software are associated to energy audit models of the analysing type. Their primary objective is to help the auditor in the quantitative assessment of energy saving potentials and evaluation of investment costs and pay backs. The use (by an auditor) of a recommended or certified (by the Operating Agent) calculation tool (provided it is used correctly!) is a certainty of results quality for the audit client.

Data collection form(s)

generally associated to the calculation tool for which they constitute the input data, this type of support document helps the auditor in collecting all the necessary information for the survey. It will be part of the final report and will also contribute to facilitating the follow up of the site energy features and the interpretation of the audit results and recommendations.

Report templates

As for data collection forms, they are frequently associated with the calculation tool of which the output results must be integrated in the report. They are over all depending on the EAM and, in many programmes are integrated in the EAM specifications. The report is the deliverable of the audit, proposing a template helps all the participants to make the most profit of the audit service + produce good quality .

Check list for quality control of audit reports

Document to be used both at operating agent level and at auditor level (self-check), it is a complement or an alternative to report templates and a practical translation of Energy Audit Models: What is specified in the EA model as expected results should be in the report and the check-list is an easy way to verify that the work has thus been done accordingly to the specifications.

Building ratings, target values or benchmarking

key figures can be used either as marketing information to spark off the need for energy audits, they are also used by the auditors as technical data to justify their recommendations in the case of simplified audits, and even can contribute to detailed audits in checking calculations or replacing data difficult to meter or evaluate either way.

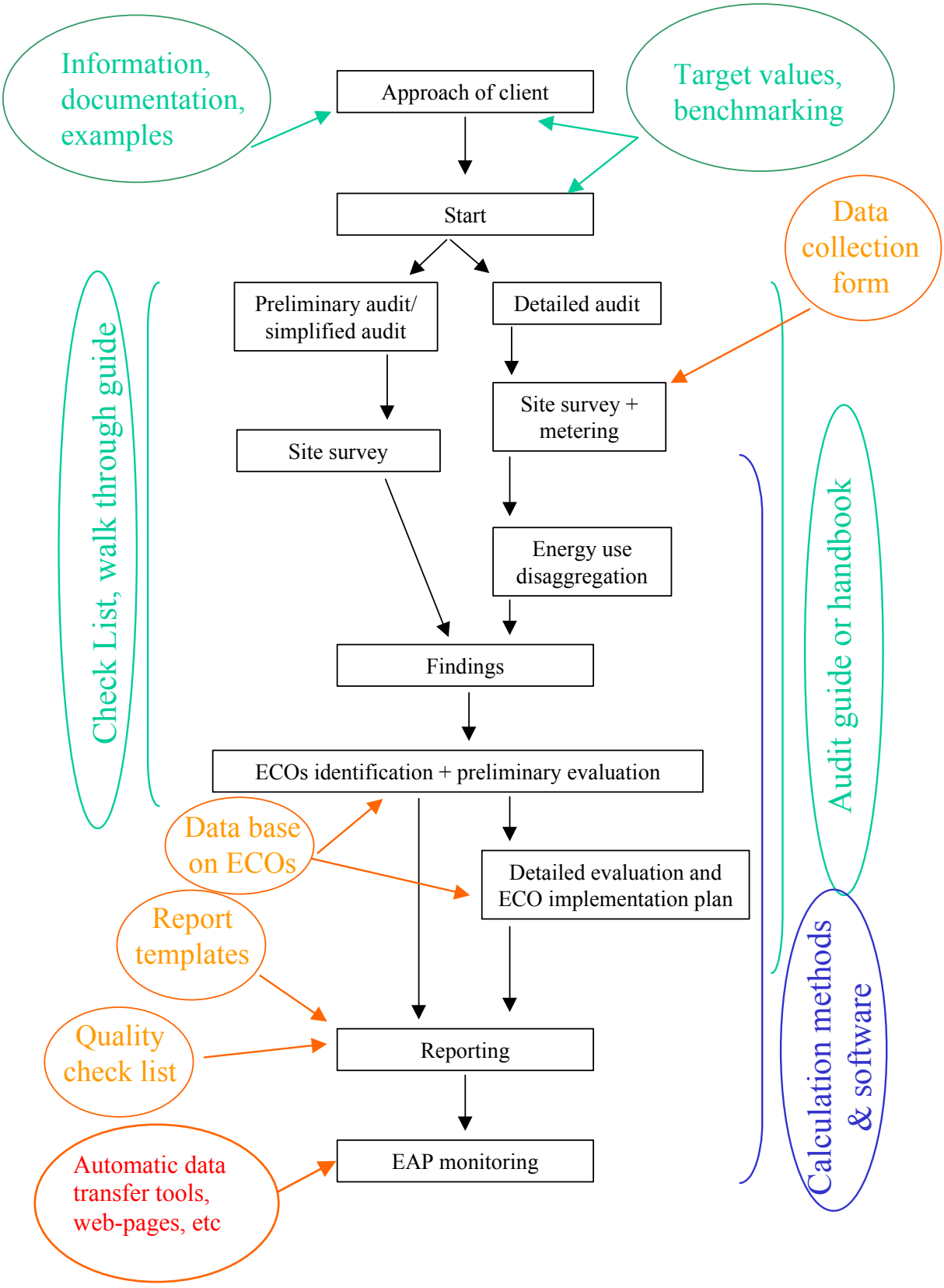
Data bases on energy conservation Options (ECOs)

One difficult part of the audit is having detailed information on costs and implementation side aspects or consequences of energy saving recommendations. A data base of ECOs encompassing this information will save a lot of time and money to the auditor (and thus help lower the cost of the audits with a maintained quality). Keeping the data up to date requires quite a lot of work from the OA .

Many of these tools may overlap and it is the responsibility of the Operating Agent to determine what is necessary to bring forward to the auditors. The OA will have to identify the needs of the professionals (from the quality check, from the monitoring or activity follow up,..) to decide on the missing "tools" .

The above mentioned tools are in general not specific of a target sector or an EAM. But their usefulness frequently corresponds to one or several phases of the audit survey. This is presented in broad outline on the following figure.

Figure 1 - Schematic phases of audit and auditor tools contribution



Operating agent strategy and options

Review of basic options

According to the identified needs, the OA will have several options in terms of tools elaboration which are presented underneath.

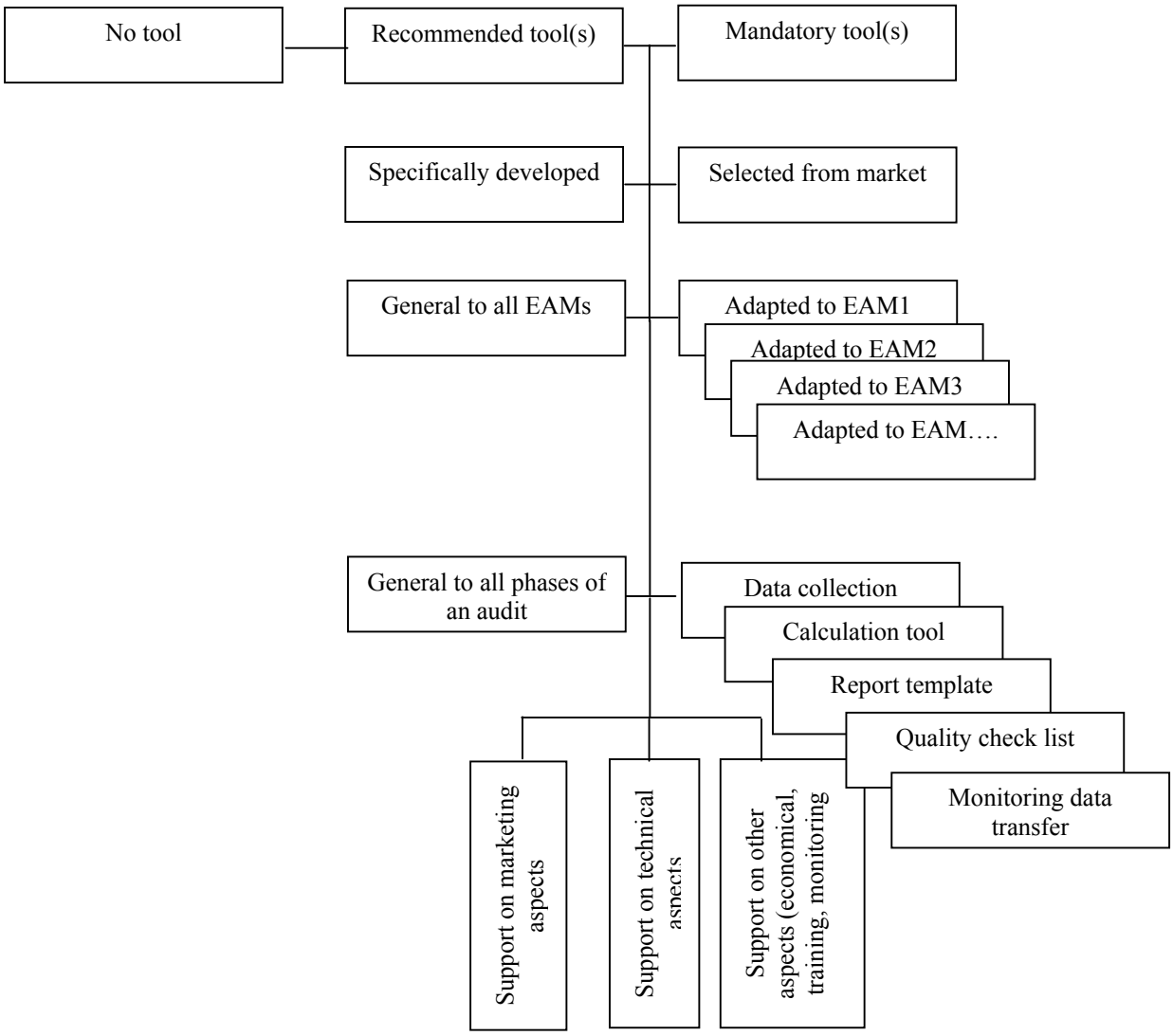


Figure 2 - Schematic of operating agent basic options

The operating agent has various options which may depend strongly on the strategy he wishes to develop taking into account the local context:
For example, if the professionals are very well organised with a high quality of service the OA may consider that there is no particular need to interfere by introducing tools on his own and will devote resources to other aspects like monitoring and evaluation.

No particular tool

The simplest solution for the operating agent that may not be the most efficient one in the long term. Clients as well as auditors will be reluctant to enter a scheme with little information. Auditing being not a "traditional" consultancy service, engineering firms will be asking support from the Operating Agent to understand how to proceed, which might lead to a huge burden on the training side.

Recommended tool(s)/ Mandatory tool(s)

When the operating agent elaborates the energy audit models, he is able to assess the capabilities of (already existing) tools to fit the work. He is also in a position to identify gaps in the marketing or technical aspects of the scheme that can be filled with appropriate tools, whether made on his own or selected from the market (see hereafter).

When indicating only recommended tools, the OA leaves it open to any auditor that would use or need some specific tool, either because he is used to it or because in a particular situation the tool is better adapted to the considered audit situation.

Mandatory tools are the easiest way to rule a scheme and run on the quality control of audit reports and find outs. Mandatory tools are often associated to mandatory schemes but the variety of encountered situations makes it difficult to cope with all cases on this compulsory basis.

Selected from market / Specifically developed

In practice it is often considered these two options are not contradictory but use in parallel. The operating agent selects a number of tools from the existing market AND develop others to fit in the situations that were not properly addressed.

The main obstacle for developing tools is the cost and delay induced by this option. The amount of resources (time and money) to develop a software, debug it and disseminate it properly can be very high. For example in France the "Mediademe" calculation software tool was not released end of 2001 whereas the DMSS was launched mid 1999.

General to all EAMs / Adapted to each EAM

It is generally observed that most schemes start with a few tools general to all EAMs (which are not very numerous when the audit programme is started). This is the case of technical handbooks and of many marketing oriented tools as well. Along with the development of the EAP, the operating agent identifies those gaps mentioned above and - because of training needs or marketing shortcomings for example - will select or develop tools fitting each EAM.

General to all phases of the EAM / versus specific per audit phase

Tools are often developed in order to facilitate the work of the auditor, to reduce audit cost and ensure a better quality of results . Developing or disseminating tools adapted at each phase (of each EAM !) may become a burdening task when periodic reviewing and updating is necessary. The longer the EA programme is active, the more complex it is to administrate when there are too numerous tools. On the other hand, giving detailed background on each step of a correctly carried out audit is an effective way to ensure that the results will be corrrectly assessed.

Consequences in terms of connections with other topics

Most important connections with other topics are indicated in the following table referring both to the options enumerated in the preceding paragraph and to the various topics addressed in the report. Other consequences may appear depending on the mix of adopted options.

Table 1 - interaction between tools options and other topics

	Promotion	EAM	Training	Quality control	Monitoring and evaluation
No particular tool	Poor marketing	EAM specifications difficult to illustrate	Little content for training of auditors	Difficult	No direct data transfer is possible for monitoring needs
Recommended tool(s)/ Mandatory tool(s)	Reliable calculations, reliable information to client on saving potential	Helps in explaining EAMs	If mandatory, obliges to organises training courses	Mandatory tools facilitate quality control	If the tools include some monitoring and evaluation aspects, prepare the necessary information
Selected from market / Specifically developed	Specially developed tools indicate the importance of EAP and thus participate in marketing the scheme	When specially developed, take easily into account special EAM features	When specifically developed, imposes to create ad'hoc training courses	Specially developed tools may give more reliable results + better quality	Specially developed tools may take into account the needs of monitoring (e.g. direct data input to database via internet)
General to all EAMs / Adapted to each EAM	Adapted tools may bring out some special EAM features for marketing needs (compact reporting, etc)	Strong interdependence if many EAMs are issued.	If there are several models and several tools, a lot of training effort is needed	EAM specific tools may give more reliable results but several models + several tools may lead to mistakes in reporting	Monitoring + data transfer is more simple if there is only one tool
General to all phases of the EAM / versus specific per audit phase	Little interaction with the other topics but strong consequences within the tool development activity because of possible overlapping of elements when separated, or gaps if not all phases are properly covered….				

Review of examples

Description of the relationships between tools (a sample) and the associated programmes

Table 2 - Review of some tools within a few (EA) programmes.

Tool name	Associated programme	Where it comes from	How many issued	Status of tool (recommended/selected/mandatory/ frequently used	…
Energy Management handbook	Branch concept for Industry (AT)	EVA and OEKV	Downloadable from EVA website	recommended	
ECREP software	Energy saving programme for federal buildings (AT)			Frequently used in the "Energy Check	Internet based
SAPRA	POE-RGCE (PO)	Developed by INESC		Recommended by DGE	
Model report	Electric utilities energy audits (BE-FL)	ELECTRABEL		Associated to Energiescan (quick audit)	
ELO-PC	ELO Scheme (DK)	ELO-Secretariat	Free for registered ELO-consultants	Mandatory for reporting energy label	Calculation and reporting tool
EK-PRO TM-Energy	EM-Scheme (DK)	Commercial tools		Mandatory for reporting energy label	Calculation and reporting tool
MOTIWATTI 2.0	Finland's EAP	MOTIVA	About 250	Recommended	Calculation and reporting tool
Energy Auditors handbook	Finland's EAP	MOTIVA	Available on electronic format from MOTIVA's website	recommended	Handbook in electronic format
Best Practice Reports	Finland's EAP	MOTIVA		Recommended	
Energy Potential Scan	EMA (NL)	NOVEM			
Energy efficiency handbook + report template	Oslo Eco Fund (NO)	Operating Agent		mandatory	
Guide du Diagnostic	DMSS (FR	ADEME	200	recommended	Handbook in electronic format
MEDIADEME 2.2	DMSS (FR)	ADEME	Dissemination in 2002	suggested	Calculation and reporting software tool

Technical information on tools

Table 3 - Description of a few tools

Tool name	Use or goals	Contact	Date of issue	Type of EAM	Target sector	Language/weather applicability in other country ?	Cost	Limitations on use	Cost of development	Availability to outsiders	Further information
ELO-PC 3.40	Energy labelling in large buildings	Danish Technology Institute	Nov 2000 (ver 3.31) May 2002 (ver 3.40)	Energy label and energy plan	Buildings larger than 1500 m2	Danish interface and data	freeware for registered energy consultants	Output Danish energy label			ELO-PC@teknologisk.dk
EK-PRO 3.02	Energy labelling in small buildings	SEBRA A/S	2000	Energy label and energy plan	Buildings smaller than 1500 m2	Danish interface and data	estimate 4000 DKK	Output Danish energy label		Commercial software	sebra@email.dk
MEDIADEME 2.2	Calculation and reporting software	ADEME	May 2002	Energy audit in buildings	Multifamily dwellings and tertiary buildings	French interface and weather data	freeware	All end uses except air conditioning	180 000 €		
MOTIWATTI 2.0	Calculation and reporting software	MOTIVA	Nov 2000	Energy audit in buildings	All types of buildings but with some limitations	Finnish, Swedish or English interface, Finnish climate data	freeware to auditors attending training	No cooling, energy, no humidification	100 000 €	CDs given only to auditors attending training courses	

Auditors tools in Energy labelling of large buildings, The ELO-Scheme (EnergiLedelsesOrdningen) (DK)

There are tools for the ELO consultant provided by the Secretariat and by the Danish Energy Agency.

The tools include

- training material from the ELO consultant training
- handbook for ELO-consultants
- catalogue of typical savings - no-cost, low-cost, investment *(Besparelsekatalog)*
- check-list *(Huskeliste)* for energy saving in buildings (for field-work)
- calculation and reporting tool *ELO PC*
- key figures for energy consumption in different building types
- the ELO homepage www.energiledelsesordningen.dk (including good examples, how to find an ELO-consultant, key-figures, about training, etc)

The computer tool is free for the registered ELO consultants. The tool is used for data collection, calculating the savings, reporting and printing the label. The site data is sent to the Secretariat in electronic format and run into their monitoring database. The tool is mainly used for registering buildings and their annual consumption of heat, electricity and water. The program is able to calculate and print energy labels and the energy plan.

The ELO Secretariat publishes key-figure reports and summaries based on the data from the sent labels. These reports are available as pdf-files from the ELO homepage.

Auditors tool for Energy labelling of small buildings, the EM scheme (Energimaerkningsordningen) (DK)

Two software companies provide computer tools for the auditors. The tools are called EK-PRO and TM-Energy. The software cost is 526-658 € / 4000-5000 DKK per licence. The programme calculates the energy use of a small building and produces the energy certificate and the energy plan. The software has been developed by architects and energy consultants. The tools and the updated versions are tested and approved by DTI.

The tools help the auditor to prepare the energy label and print it on the pre-printed form they have purchased from the EM Secretariat. The price of a form is 12,5 € / 100 DKK.

The tool also forms “a database” of each labelled site and this data is sent to the EM Secretariat database for monitoring.

A new web-based tool is being developed. This would help the consultants in having the latest data available (e.g. energy prices, statistical specific consumption, etc). The new tool would make the reporting and data-management of the labels more efficient.

The other tools for EM Consultants are

- Handbook (from training)
- brochures and other material from the DEA
- “Energikonsulent nyt” information paper, appearing four times a year, introducing new rules, clarifications, frequently asked questions, general information, etc

- home page for the EM scheme: www.emsekretariat.dk (statistics , how to find an EM Consultant, about training, prices of labelling, energy prices, building type identification codes, consultants' pages, etc)

Other tools on energy labelling

- www.sparenergi.dk , the web pages of DEA for building owners (energy labelling, what to do when buying or selling a house, principles of energy monitoring, typical saving measures and saving tips, list of publications, links, etc)
- www.energioplysningen.dk , the web pages of DEA on energy information and energy saving (energy use, energy saving, renewable, research and statistics, energy grants etc for households, buildings, industry, etc)

Table 4 - Overview of Danish software tools

	Limit of use	**configuration**	**User and status**	**Price**	**information** contact
ELO-PC	buildings over 1.500 m2. Calculates heat, electricity use, primary energy and CO2 emissions (Energiplan).	Windows 95, 98 NT. Internet Explorer 4.01. Pentium PC, 32 Mb RAM.	Energy consultants ELO-PC is mandatory for registered energy consultants	Free (for ELO consultants)	Jean-Marc Huet Teknologisk Institut, Energi Postboks 141 DK-2630 Tåstrup Tlf. 72 20 25 37 Fax 72 20 25 00 e-mail: ELO-PC@teknologisk.dk
EK-PRO (vers. 3.02)	For buildings under 1.500 m2. Calculates heating needs, electricity Input data: evaluation of the energy use of the building. Calculates a standard consumption for the building (energy label) and the possibilities for savings (energy plan)	Windows 95, 98, 2000 eller NT. Pentium PC, 32 Mb RAM.	The energy consultant meets the mandatory requirements for preparing an energy label according to the regulations .	3.800 DKK (500 €) excl. VAT.	Uffe Groes SEBRA A/S Fibigervej 1 DK-4792 Askeby Tlf: 55 81 71 21 Fax: 55 81 72 79 e-mail: sebra@email.dk
Bygningers varmebehov 98	Heating demand and energy need.	- Windows 95, 98 NT. - Internet Explorer 4.01. - Pentium PC, 32 Mb RAM.	Engineers and architects. Available from By og Byg.	1.250DKK (165 €).	http://www.byogbyg.dk/
VAKS ELO SYSTEM	For buildings over 1.500 m2. Calculates the consumption of heating, electricity and water and CO2-emissions (energy label). Input data: measured consumption. Calculates expected consumption and costs/lifetime for energy saving measures (energy plan) Energy management..	Windows 95, 98 eller NT. Internet Explorer 4.01. Pentium PC, 32 Mb RAM.	ELO konsulent Godkendt 3.-part program under ELO ordningen	2.875 DKK (378 €) excl. VAT	VAKS DATA Kallevadvej 5 4760 Vordingborg tlf: 55 98 63 36 fax: 55 98 63 67 vaksdata@vaksdata.dk

Auditors' Tools Energy Audit Programme (Finland's EAP)

MOTIWATTI 2.0 Software

The main auditor tool used in Finland is the MOTIWATTI 2.0 software, which has been developed especially for the auditors. First version of MOTIWATTI was released in December 1993. Versions 1.0 to 1.8 were based on EXCEL but in 1997 Motiva faced the fact that the software could no longer be updated – one problem with EXCEL was the continuous need for updates whenever Microsoft released something new. The old versions had also some restrictions and finally s decision was made to launch a development project. The total cost for the two-year development project of the new MOTIWATTI 2.0 has been approx. 100.000 EUR. Version 2.0, which is practice e totally new program compared to the old versions, was released in the autumn 2000. The program is in principle a shareware but available only to Motiva Energy Auditors. The MOTIWATTI 2.0 CDs have been given only to auditors who participate either the Motiwatti 2.0 Software Course or The Motiva Energy Auditor Basic Course.

The MOTIWATTI 2.0 is a practical tool for an energy auditor. The building to be audited is modelled into the programme and then the auditor can start simulations on individual energy saving measures. Traditionally the calculations on energy saving measures, if done properly, have required a lot of time. One idea of the programme is to form a detail breakdown of the energy use, based on the measured consumption data and the actual use and operating information of the building service systems. When all systems have been "created" and the theoretical consumption equals the measured consumption, the auditor can be quite sure that the saving of a considered measure is at correct level.

The programme has some restrictions, some due to irrelevant meaning in Finland, some due to unavoidable inaccuracy when the amount of input data needs to be limited. Some notes about the restrictions.

- Is not a simulation tool for capacities or target consumption
- Does not calculate heat transfer dynamically
- Does not calculate cooling energy
- Does not handle humidification processes
- Is not suitable for special spaces e.g. glass atriums
- Does not use hourly data in calculations although takes into account the different hourly outdoor temperatures when e.g. the running hours of a ventilation unit are changed

The MOTIWATTI 2.0 has also the two standard reporting tables, which are required from the auditor as a part of the reporting. The emissions of used energy sources can be defined and in addition to energy units and costs, the programme will also calculate reductions in CO2 for each energy saving measure.

In comparison to manual calculation or auditors own calculation tools the MOTIWATTI 2.0 has solved the following traditional problems:

- The net effect of overlapping measures is calculated automatically
- Side effects e.g. decreasing internal electrical loads (lighting) will increase the demand for heating
- The order in a set of measures - the profitability of a measure depends on the order of implementation, e.g. reducing ventilation running hours and installing a heat recovery system – when the list of measures has been created the auditor has the freedom to change the order without new calculations
- The optimal option of the several alternatives available, the calculation must be done several times but quickly
- Different tariffs, profitability is sensitive to the cost of saved energy and if the tariff varies or is changed the profitability may change significantly, also a matter of the order of the measures

The MOTIWATTI 2.0 Software requires the following user environment:

- Windows 95, 98, 2000, NT 4.0
- Min 800x600 resolution
- Memory min. 32 MB (64 MB recommended)
- Processor min. Pentium 700 MHz
- 25 MB of free disk space
- MS Excel 97 needed for outputs

Auditors' Tool in the DMSS (France's EAP)

The MEDIADEME software which is the computer version of the "méthode de diagnostic". Version 2.1 was released as a beta version in Marsh 2001, and a "commercial" version (v2.2) is being released beginning of 2002.It is an ACCESS based C++ application but the software was initially written in C in a DOS environment (MEDIA-LC) in the late 80s. Although the calculations gave satisfaction, the auditors at that time complained about the poor user friendliness of the interface and the printing difficulties. Transcription in a WINDOWS environment was initiated in 1998 but the people who had developed and maintained the initial tool where not available anymore.

A first transcription was released by a computing firm and the langauge and computer power of nowadays equipment was used to incorporate new specifications. The development was boosted by the 1999 decision to lauch an Energy Audit programme but several software being developed simultaneously to fit the different EAMs, the more "complex" one was the most delayed. Development cost over the period is estimated at 180 000 € for a tool that has nothing in common with the MEDIA-LC of 1986 !

MEDIADEME is a typical auditor software in that sense it makes no automatic sizing of any kind and calculates only on the recorded data. ECOs effects are re calculated by changing parameters (on the auditor decision) and all energy end uses are re computed avoiding the use of pre defined saving percentages and allowing for combinations of ECOs.

The programme has limitations that are consequences of the calculation method itself but considered relevant in the case of audits for most of encountered situations:
- It does calculations on a hourly basis for electricity end uses and on a 10-day period for space heating and hot water production. But uses monthly weather data and re calculates hourly temperatures
- No air conditioning calculation is possible in that version
- Higly glazed buildings or spaces (atrium, large gree houses) may not be properly evaluated

It was developed to avoid use of calculation methods from the building regulation (for new construction) which do not fit audits but were frequently used by consultants with improper adaptations of their own.

- The net effect of overlapping measures is calculated automatically as well as side effects
- It allows to reiterate quickly different combinations of ECOs
- It incorporates a specific module for energy tariffs
- A detailed help in html is also included which gives the explanations for the software use as well as the justifications for the calculation method.

In principle MEDIADEME is a freeware and is distributed as such with a corresponding licence. It is planned to offer it in priority to consultants attending training courses organised by or on behalf of ADEME but it will also be handed over to partners (ACCOR hotel group, Ministers, ….). There is no protection on its copying but the installation package includes acceptance of the licence.

The MEDIADEME Software requires the following user environment:

- Windows 95, 98, NT 4.0
- Min 800x600 resolution
- Memory min. 32 MB (64 MB recommended)
- Processor min. 486
- 25 MB of free disk space

Table 5 - Detailed budget for tools development in the French DMSS

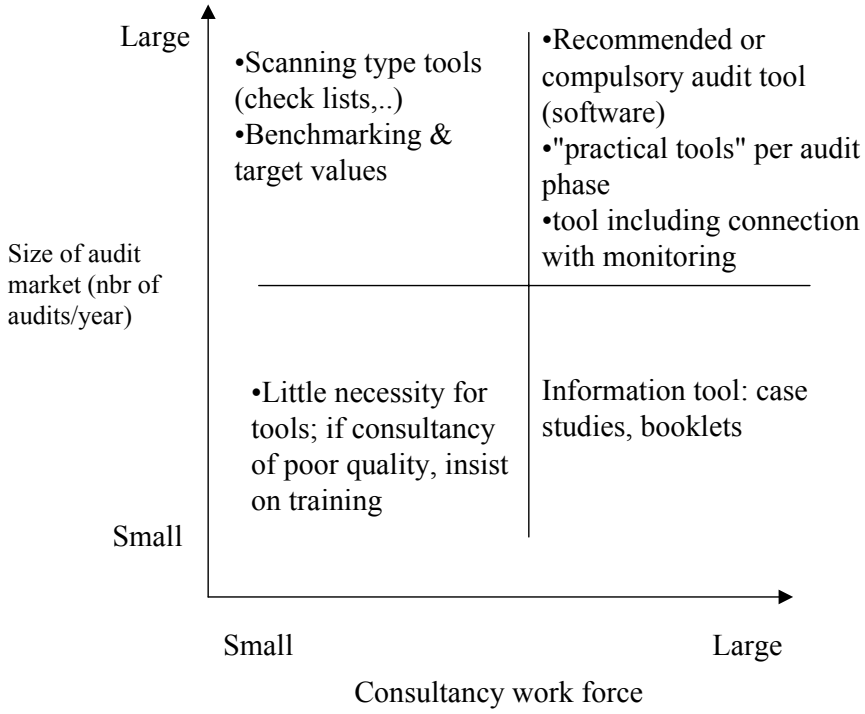
Tool name or identification	action	Cost (kEuros)	Dissemination	Miscellaneous
AMICE software tool	specifications	9		
	Software initial version	30.5		
	Updates + debug	54+23.8		
	tests	11	About 50	
COIND'TABL (excel calculation sheet + report template + help)	Preparation, development and test	35,7	100 end of 2001, planned to raise up to 250 end of 2002	Simplified version for individual houses requested since
MEDIADEME	Initial specifications V1	56 + 68		
	V2 (new spec, electricity end uses, tariffs,…)	137		
	V2.2	52	Started may 2002	
	Help "manual"	26,4		
	Tests on Beta version (V1, V2)	15,2		
Auditing Handbook	CD ROM on electronic format of a previously edited document (issued in 1987 and updated internally)	46.5	500	
www.evalure.com	Creation of internet based monitoring tool	28.5		Only for buildings
	Maintenance	16.8		

Recommendations

It is essential to understand that there is a huge difference between a starting up EAP and an on going one. It is also evident that, when building up a new scheme, the Operating Agent will have neither the capability nor the time to elaborate all the necessary tools. Thus its strategy will be strongly depending on the status of progress of the Programme.

Building up a new scheme

Elements to take into account are the aims of the programme (target sectors and objectives) and the situation of the consultancy market. The main recommendations are synthesized on the following figure.



These are "good sense" recommendations linked to a starting programme which generally focuses on one (or a limited number of) target sectors and uses very few Energy Audit Models.

Still for all type of EAP¨, it seems - and that can be observed in most, if not all, countries - necessary to provide auditors with a handbook[2] of some sort on energy audits. The only exception will be when the programme is targeted to a limited number of premises or sites and the audits will be carried out by a limited number of auditors who will be the only experts on the topic in the field.
Otherwise this handbook MUST be made available within the 6 first months of the programme. No such haste is needed for a software (which can take 12 to 24 month to elaborate) unless the market of

[2] *The actual" handbook" might be replaced by very good guidelines on the audit procedure, content of work and reporting. Actually there is no definitive limit between audit guidelines and a handbook. Maybe the handbook includes more information on the technical issues, typical savings etc and the guidelines concentrate on the methodology. The guidelines should be good enough from the very beginning of the programme, if you start with light guidelines, the auditors will find all kinds of pig-holes to ease their work and - unfortunately - to make poor reports.*
Even if there is a limited number of auditors doing a limited number of audits, some sort of guideline is needed anyway to have uniform quality.

software editing is totally empty of usable products. This situation is rarely met because there are a number of English or American software that can be used worldwide (DOE2,..) and because consultants usually have also developed calculation tools of their own .

Administrating an on going programme

If little or no monitoring is conducted, there will be little opportunity for the Operating Agent (OA) to assess progress, identify barriers or missing elements in its scheme. Thus the importance of monitoring and evaluation is stressed again. When it is correctly organised the OA will be faced with two situations:

- extending the EAP: with more target sectors and or more energy audit models
- correcting its scheme because progress are far beyond objectives

In the first situation, the OA will have to take decisions similar to those in building up a new scheme. In practice it will have a far better knowledge of the consultancy market and should thus be able to sharpen its analysis of the situation and of the actual needs of the professionals.

- Introducing new models means new tools or additional training to the auditors. Report templates, check-lists and field-work guides may be useful here.

In the latter, the OA should be able to identify the tools that would improve the efficacy of the implementing tool(s) that he has already introduced. Whetehr the question is more technical, economical or purely a lack of information it will be in a position to decide that he needs to "offer" to the auditors either some technical information or help to reduce the cost of audits or market better the scheme with feed back on successful audit surveys or benchmarking.

The OA has to identify the reasons for the programme not being successful, the solutions being not only on the tool side but also depending from the choices in other topics:

- lack of marketing from the auditors, lack of interest from clients, insufficient marketing material, not enough data available on results achieved : *this could be improved by producing brochures and case-studies*
- not enough reliable data available *: leads to the monitoring system and a need for adapted support tool for data collection…*
- audits have a bad reputation among clients because of poor quality of work from auditors *: need for better guidelines, a handbook, report templates . A better quality control & training might also be the solutions* .
- audit clients are confused because of too difficult guidelines and too many audit models : *simple step-by-step instructions to clients and auditors, model-specific case studies…*

Ther is no unique "tool box" in the field of Energy Auditing Programme; it must be a mix of the various existing options that fits to the market needs: audit market and consultancy market.